<u>WHAT IS CLAIMED IS</u>:

1.   A method of determining an implementation of a user design on a programmable device including reconfigurable logic hardware and fixed-configuration secondary hardware, the method comprising:

determining a plurality of potential input assignments for a portion of the user design corresponding with at least one function of the fixed-configuration hardware;

ranking the plurality of potential input assignments; and

selecting the highest ranked input assignment as an implementation of at least a subset of the portion of the user design.

2.   The method of claim 1, wherein each of the plurality of potential input assignments defines an assignment of at least one input variable of the user design to an input of the fixed configuration secondary hardware.

3.   The method of claim 1, wherein the fixed-configuration secondary hardware enables load and clear functions of a register of the programmable device.

4.   The method of claim 1, wherein each of the plurality of potential input assignments is associated with at least one register of the user design.

5.   The method of claim 4, wherein ranking the plurality of potential input assignments includes determining the number of registers of the user design associated with each of the plurality of potential input assignments.

6.   The method of claim 5, wherein selecting the highest ranked input assignment includes selecting the potential input assignment with the most associated registers from the plurality of potential input assignments.

7.   The method of claim 4, comprising disassociating at least one register from at least one of the plurality of potential input assignments, wherein the disassociated register is associated with the selected potential input assignment.

8.   The method of claim 1, comprising removing the selected potential input assignment from the plurality of potential input assignments, thereby forming a subset of the plurality of potential input assignments.

1   9.   The method of claim 8, comprising evaluating a criteria for the subset

2   of the plurality of potential input assignments; and

3   in response to a determination that the criteria exceeds a threshold, reiterating

4   the steps of determining a plurality of potential input assignments, ranking the plurality of

5   potential input assignments, and selecting the highest ranked input assignment for the subset

6   of the plurality of potential input assignments.

1   10.   The method of claim 2, wherein determining a plurality of potential

2   input assignments comprises:

3   enumerating a plurality of sets of input variables associated with the portion of

4   the user design; and

5   creating a plurality of potential input assignments from at least a portion of the

6   sets of input variables.

1   11.   The method of claim 10, further comprising:

2   creating a logic diagram describing the function of each of the plurality of sets

3   of input variables; and

4   determining from the logic diagram whether the function of each of the

5   plurality of sets of input variables corresponds with at least one function of the fixed-

6   configuration hardware.

1   12   The method of claim 11, wherein the logic diagram is a truth table.

1   13.   The method of claim 11, wherein the logic diagram is a Karnaugh map.

1   14.   The method of claim 11, wherein creating a plurality of potential input

2   assignments comprises applying at least one heuristic to each of the plurality of sets of input

3   variables having a function corresponding with at least one function of the fixed-

4   configuration hardware, thereby determining at least one corresponding potential input

5   assignment.

1   15.   The method of claim 10, wherein enumerating a plurality of sets of

2   input variables includes using cut enumeration.

1   16.   The method of claim 1, further comprising:

2   programming the programmable device with the highest ranked input

3 assignment as at least the subset of the portion of the user design.

1   17. A programmable device adapted for implementing a user design,

2 comprising:

3   reconfigurable logic hardware adapted to implement a first portion of the user

4 design; and

5   fixed-configuration secondary hardware adapted to implement a second

6 portion of the user design, wherein the second portion of the user design is determined by an

7 assignment of at least one input variable of the second portion of the user design to at least

8 . one function of the fixed-configuration hardware.

1   18. The programmable device of claim 17, further comprising:

2   a plurality of logic cells, each logic cell including a register connected with a

3 unit of the reconfigurable logic hardware and a unit of the fixed-configuration secondary

4 hardware.

1   19. The programmable device of claim 17, wherein the assignment of at

2 least one input variable is selected from a plurality of potential input assignments, each

3 potential input assignment being associated with at least one register, and further wherein the

4 assignment is selected from the plurality of potential input assignments according to the

5 number of associated registers.

1   20. An information storage medium including a set of instructions adapted

2 to operate an information processing device to perform a set of steps, the set of steps

3 comprising: determining a plurality of potential input assignments for a portion of the user

4 design corresponding with at least one function of the fixed-configuration hardware;

5   ranking the plurality of potential input assignments; and

6   selecting the highest ranked input assignment as an implementation of at least

7 a subset of the portion of the user design.

1   21. The information storage medium of claim 20, wherein each of the

2 plurality of potential input assignments defines an assignment of at least one input variable of

3 the user design to an input of the fixed configuration secondary hardware.

1   22.   The information storage medium of claim 20, wherein the fixed-

2   configuration secondary hardware enables load and clear functions of a register of the

3   programmable device.

1   23.   The information storage medium of claim 20, wherein each of the

2   plurality of potential input assignments is associated with at least one register of the user

3   design.

1   24.   The information storage medium of claim 23, wherein ranking the

2   plurality of potential input assignments includes determining the number of registers of the

3   user design associated with each of the plurality of potential input assignments.

1   25.   The information storage medium of claim 24, wherein selecting the

2   highest ranked input assignment includes selecting the potential input assignment with the

3   most associated registers from the plurality of potential input assignments.

1   26.   The information storage medium of claim 23, comprising

2   disassociating at least one register from at least one of the plurality of potential input

3   assignments, wherein the disassociated register is associated with the selected potential input

4   assignment.

1   27.   The information storage medium of claim 20, comprising removing the

2   selected potential input assignment from the plurality of potential input assignments, thereby

3   forming a subset of the plurality of potential input assignments.

1   28.   The information storage medium of claim 27, comprising evaluating a

2   criteria for the subset of the plurality of potential input assignments; and

3   in response to a determination that the criteria exceeds a threshold, reiterating

4   the steps of determining a plurality of potential input assignments, ranking the plurality of

5   potential input assignments, and selecting the highest ranked input assignment for the subset

6   of the plurality of potential input assignments.

1   29.   The information storage medium of claim 21, wherein determining a

2   plurality of potential input assignments comprises:

3   enumerating a plurality of sets of input variables associated with the portion of

4 the user design; and

5   creating a plurality of potential input assignments from at least a portion of the

6 sets of input variables.

1   30. The information storage medium of claim 29, further comprising:

2   creating a logic diagram describing the function of each of the plurality of sets

3 of input variables; and

4   determining from the logic diagram whether the function of each of the

5 plurality of sets of input variables corresponds with at least one function of the fixed-

6 configuration hardware.

1   31 The information storage medium of claim 30, wherein the logic

2 diagram is a truth table.

1   32. The information storage medium of claim 30, wherein the logic

2 diagram is a Karnaugh map.

1   33. The information storage medium of claim 30, wherein creating a

2 plurality of potential input assignments comprises applying at least one heuristic to each of

3 the plurality of sets of input variables having a function corresponding with at least one

4 function of the fixed-configuration hardware, thereby determining at least one corresponding

5 potential input assignment.

1   34. The information storage medium of claim 29, wherein enumerating a

2 plurality of sets of input variables includes using cut enumeration.

1   35. The information storage medium of claim 20, further comprising:

2   programming the programmable device with the highest ranked input

3 assignment as at least the subset of the portion of the user design.